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A SHORT SYNOPSIS OF THE SPECIES OF OCHODÆUS INHABITING THE UNITED STATES.

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Including the two new species described in the present paper, the number of species of *Ochodæus* known from within our faunal limits is now nineteen. As the last review of the genus, that by Dr. Horn in the Transactions of the Am. Ent. Soc., 1876, dealt with only eight species a new synoptic table is believed to be opportune, and in order that the student may be for many purposes relieved of the necessity of consulting the scattered descriptions, reference is made to the principal distinguishing characters of all previously described species.

In the following table I have drawn less upon the form of the mentum, and more on the cephalic armature and form of the sutural angle of the elytra, as these latter characters may be more quickly and accurately verified, the true form of the anterior portion of the mentum being frequently difficult of determination. The order of species will therefore be found to differ somewhat from that of Horn.

TABLE OF SPECIES.

1. Elytra punctate striate.....2.
 Elytra not punctate striate.....9.
2. Mentum elevated in the form of a transverse wedge.
 Prosternum strongly lobed in front, external outline of mandibles broadly arcuate,
 sutural angle of elytra dentiform, basal joint of hind tarsi thickened, arcuate
 and longer than the following joints united.....1. *pectoralis* Lec.
 Prosternum not lobed in front, external outline of mandibles ogival, sutural
 angles of elytra not dentiform, basal joint of hind tarsi slender and shorter
 than the remainder.....2. *gnatho* Fall.
3. Mentum flat or concave.....3.
3. Front or clypeus not at all tuberculate.....4.
 Front with a distinct more or less acute or dentiform tubercle, except in *presidii*...7.
4. Sutural angle of elytra not dentiform.....5.
 Sutural angle of elytra dentiform; upper tooth of front tibiæ nearer to the middle
 tooth than to the base.....6.
5. Vertex not carinate; mentum deeply longitudinally impressed; elytral striæ feebly
 impressed and finely punctured.
 Posterior tibiæ of male with an acute tooth at middle, posterior femora of male
 without apical tooth.....3. *simplex* Lec.

Posterior tibiæ of male with a more or less sharply defined tooth or angulation at apical fourth; posterior femora with unciform tooth at apex.

4. *planifrons* Schæf.

Posterior tibiæ of male "slightly dilated at middle"; posterior femora not toothed at apex.....5. *ulkei* Horn.

Vertex with more or less distinct short transverse carina; elytral striæ more deeply impressed and less finely punctured.

Mentum as long as wide, rather deeply longitudinally impressed in front, more broadly so posteriorly; posterior femora of male with apical unciform tooth; posterior tibiæ of male with an acute tooth just behind the middle.

6. *musculus* Say.

Mentum transverse, not impressed, posterior femora of male toothed at apex; posterior tibiæ of male simple.....7. *striatus* Lec.

6. Color uniform, but varying from brownish to testaceous.

Vertex of male with a transverse carina, which is feebler or sometimes lacking in the female.

Vertical carina short, interrupted at middle; frontal lobe not margined.

8. *inarmatus* Schæf.

Vertical carina longer, not interrupted at middle; frontal lobe strongly margined.....9. *kansanus* sp. nov.

Vertex not carinate in either sex.

Frontal margin (male) elevated each side into a small acute tubercle; hind femora of male toothed on lower edge at apical third.....10. *biarmatus* Lec.

Frontal margin and hind femora simple in both sexes.

11. *peninsularis* Horn.

Head and thorax black, elytra dull brownish yellow, under surface and legs piceous12. *californicus* Horn.

7. Front not distinctly tuberculate, the upper or posterior cariniform margin of the frontal lobe merely a little more prominent at middle; hind tibiæ flattened, parallel, and about one third as wide as long (male).....13. *presidii* Bates.

Front tuberculate.....8.

8. Frontal lobe broad, the tubercle at the anterior margin.

Hind tibiæ broadly flattened and compressed, about one half as wide as long (male).....14. *repandus* sp. nov.

Hind tibiæ normal.....15. *nimius* Fall.

Frontal lobe more strongly advanced, the tubercle more or less remote from the margin.

Mandibles almost evenly arcuate externally, frontal lobe truncate.

16. *frontalis* Lec.

Mandibles subangulate and sinuate externally, frontal lobe arcuate.

Mentum rather deeply emarginate at apex, the lateral angles acute; frontal tubercle strongly developed, forming a short stout horn.

17. *mandibularis* Linell.

Mentum with a small faint emargination at apex, the lateral angles rounded; frontal tubercle small.....18. *sparsus* Lec.

9. Form elongate; hind trochanters spined, one spur of both middle and hind tibiæ pectinate.....19. *estriatus* Schæf.

1. *O. pectoralis* Lec., Trans. Am. Ent. Soc., 1868, p. 51.

The mental wedge is in this species as wide at summit as at base, the summit not or but feebly emarginate, the front face longitudinally a little concave, the rear face nearly flat. Using the phraseology of Dr. Horn the clypeal margin is narrowly double; that is to say, it is slightly thickened or elevated with a well defined upper margin. The head is without elevations. Length 6.5–7.5 mm.

The species is rare in collections and I have seen only males. It occurs in New Mexico and Arizona.

2. *O. gnatho* Fall., Trans. Am. Ent. Soc., 1907, p. 247.

The mental wedge is much thinner at base (from front to back) than in *pectoralis*, the summit emarginate and much narrower than the base, the front face concave from top to bottom instead of from side to side. There is a small tubercle at the middle of the clypeal margin and behind this there is a slight concavity. The extraordinary width of the head in conjunction with the strongly produced mandibles constitute the most striking features of this species; the prothorax is also relatively wider as compared with the elytra than usual. The following measurements (in hundredths of an inch) express these relations exactly, like measurements of my single example of *pectoralis* being given for comparison.

	<i>Gnatho</i> (type). New Mexico.	<i>Gnatho</i> . Yuma, Ariz.	<i>Pectoralis</i> .
Width of head.....	10.1	7.8	6.8
“ prothorax.....	13.9	10.2	11.3
“ elytra.....	13.7	10.4	13.9
“ head relative to that of elytra..	.73	.73	.49

The type from Mesilla, New Mexico, and several nearly similar examples from Yuma, Arizona, are all that are known to me. The length varies from 5.5 to 7.5 mm.

3. *O. simplex* Lec., Proc. Acad., 1854, p. 222.

No male of this species is at hand and the tabular characters are taken from Horn's Synopsis. The propygidial carinæ are said by Horn to be exactly parallel, but I find them to be a little divergent in front, though very nearly parallel posteriorly. The upper tooth of the front tibia is small and much nearer the base than to the median tooth. The elytral intervals are wide, the striæ very feebly impressed and the stria punctures less conspicuously larger than those of the in-

tervals than in the greater number of species. The length as given by LeConte is 8 mm. ; by Horn 5-6.5 mm., but it must be remembered that the measurements of the latter author extend from the anterior margin of the prothorax to the tip of the elytra only.

The species is known from Texas, New Mexico, Colorado and Nevada.

4. **O. planifrons** Schæf., Can. Ent., 1906, p. 269.

In the single male example at hand, the elytral striæ are feebly impressed, the intervals nearby flat and the strial punctures but little larger than those of the intervals. The mentum is deeply longitudinally impressed, the channel of nearly equal width throughout. According to Schaeffer the female differs from the male in having the hind tibiæ simple, the hind femora with a smaller and more obtuse apical tooth, and the clypeus slightly broader. The species is of average size ; it occurs in the Huachuca Mts. of southern Arizona.

5. **O. ulkei** Horn, Trans. Am. Ent. Soc., 1876, p. 182.

This species was described from a single specimen from Nevada in the Ulke collection, and I have not been able to obtain an example. There is in the LeConte collection a New Mexican specimen placed beside the *ulkei* label which I suspect is the real thing. It has the simple head and nearly parallel propygidial lines as described by Horn, and the hind tibiæ are obtusely angulate on the lower edge behind the middle (said in the description to be slightly dilated at the middle). In common with the two preceding species, the elytral striæ are feeble and unusually finely punctate. The longitudinal impression of the mentum is "very deep, the angles elevated when viewed from beneath and the tip not perceptibly emarginate." Horn gives the length as 5 mm.

6. **O. musculus** Say (*Balvoceras*), Boston Jour., 1837, p. 178.

Opacus Lec., ♀, Trans. Am. Ent. Soc., 1868, p. 51.

Americanus Westw., Trans. Ent. Soc. London, Ser. II, 2, p. 66.

There are no characters of importance to add to those used in the synoptic table. The species is of medium size and of a rather dark ferruginous brown color when mature. It is a well known species of more eastern range than any other—if we except the Florida record for *frontalis*—and with this exception is the only species that has occurred east of the Mississippi. Horn records it from Michigan, Dakota and Nebraska ; it is known to me also from western Indiana, Illinois, Kansas and Manitoba (Winnipeg).

7. **O. striatus Lec.**, Proc. Acad., 1854, p. 222.

Size, color and form of *musculus*, the frontal lobe is not margined, however, and the elytral striæ are better marked than in *musculus*. The species seems to be rare in collections. There are two examples in the LeConte collection, both from Arizona. Horn gives also New Mexico.

8. **O. inarmatus Schaeff.**, Can. Ent., 1906, p. 270.

A rather large species, though as usual variable in size, of a brownish ferruginous color as in *musculus*. Schaeffer describes the mentum as being "deeply longitudinally impressed from base to apex," but in my only representative of the species it would be more accurately described as flat posteriorly, deeply abruptly impressed in front, the channel narrowing and growing shallower behind, disappearing before reaching the basal margin. The femora and tibiæ are entirely unarmed in all known specimens and Mr. Schaeffer remarks that what he takes to be the females differ from the males only in having the head less distinctly carinate and hardly at all impressed before and behind the carina. The teeth of the anterior tibiæ are subequidistant, the upper tooth well developed and much more remote from the base than from the middle tooth. My single example measures 7.5 mm. in length. The species occurs in the Huachuca Mts. of Arizona.

9. **O. kansanus, new species.**

Oblong oval, moderately robust, testaceous, with short semi-erect pale hairs. Labrum moderately emarginate. Mentum longitudinally impressed from apex to base, the channel broader and less deep posteriorly. Frontal lobe with strong cariniform upper margin, vertex with a smooth transverse carina which is longer and well developed in the male, shorter and less developed or subobsolete in the female, head scarcely granulose, the punctures not dense and nearly simple, at least in the male. Prothorax not quite twice as wide as long, surface moderately densely granulose, median line feebly impressed in posterior half. Elytra about one eighth longer than wide, twice as long as, and not or but very slightly wider than the prothorax; striæ moderately impressed, the intervals irregularly, subtriseriately punctate, the punctures nearly as coarse as those of the striæ; sutural angle dentiform. Upper tooth of front tibiæ strong, remote from the base, and rather nearer the middle tooth than the latter is to the apical one. Femora and tibiæ simple in both sexes. Basal joint of hind tarsus subequal in length to the three following. Length 4-6 mm.; width 2.2-3.3 mm.

Habitat. — Hamilton Co., Kansas (Snow); McPherson, Kansas (Knaus); Las Vegas, New Mexico (Fenyès).

This species is apparently not rare in Kansas, at least it has been taken in considerable numbers both by the late Professor Snow and by Mr. Knaus. It has perhaps been confused in collections with *biarmatus*. I have considered the possibility of this species being the *duplex* of LeConte, unrecognized by Horn, who at the time of writing declared that he could find no type. The brief tabular characters given by LeConte constitute the only description and are as follows: "Middle lobe of front scarcely or not at all margined; elytral striæ deep, strongly punctured, head with two transverse ridges." The size is given as 6 mm. and the type is said to be from Texas (Ulke Coll.). In *kansanus* the front is very distinctly margined and the elytral striæ are not especially strongly punctured; there is therefore little probability that the two are identical. I however wrote to Dr. Holland, of the Carnegie Museum, asking if the Ulke collection contained the type of *duplex*, but have received no answer to my communication.

It is a fact worthy of remark that in all our species having the sutural angle dentiform, the upper tooth of the front tibiæ is nearer to the middle tooth than to the base of the tibia. Of the other species represented before me (*ulkei*, *striatus* and *estriatus* lacking) this is true only of *pectoralis*.

10. *O. biarmatus* Lec., Trans. Am. Ent. Soc., 1868, p. 51.

One of our smallest species and in my experience the one most abundantly represented in collections. Horn remarks that the sexes are alike in having a tooth on the lower edge of the hind thighs at about one third from the knee. My own observation is that this tooth is present only in the male. This species is the only one in our fauna having the frontal margin terminating each side in an acute tubercle in the male. The species occurs in Kansas, Texas and New Mexico.

11. *O. peninsularis* Horn, Coleop. of Baja Cal., Suppl. I, Proc. Cal. Acad. Sci., V, 1895, p. 224.

Of this species Horn writes: "Most closely related to *biarmatus* and more especially to the female (of the latter) which has not the clypeal tubercles of the male." He finds no armature of either femora or tibiæ, but in certain specimens which he assumes are males, the hind tibiæ appear somewhat shorter and more hairy. The size given is 4.5-5 mm.

Habitat. — Lower California (San Lazaro and Sierra El Taste).

12. *O. californicus* Horn, Proc. Cal. Acad. Sci., V, 1895, p. 224.

This rare little species may be recognized instantly by its color, which is unique in the genus. The mentum is wider than long, sides parallel, apex a little emarginate, the lateral angles rounded, surface rather broadly and moderately deeply impressed in front, becoming nearly flat toward the base. The frontal lobe is distinctly margined, the vertex with a short obtuse carina, which is slightly impressed at middle. The type of the species was sent by the writer to Dr. Horn who states that it is a female, the head without ridges and the clypeal margin not reflexed. The three examples before me are perhaps all males, though there is no armature of the legs or other indications of sex. The size varies but little, the length ranging from 4 to 4.5 mm. All examples known to me have been taken either by Dr. Fenyès or the writer, and all occurred flying low over country roads by day, and their behavior and in fact the facies of the beetle strongly suggest *Onthophagus*. The other species of the genus so far as I am aware fly only at night and are often attracted to lights. *Californicus* has been taken in April and May at Pomona and Pasadena in southern California, and it, with the anomalous *estriatus* constitute the only representatives of the genus in the Pacific fauna.

13. *O. præsidii* Bates, Biol. Cent. Am. Coleop., II, pt. 2, p. 106.

This species is best recognized by the form of the hind tibiæ in the male, as indicated in the table. One other species — *repandus* — possesses this character in a still greater degree, but this latter has a well developed frontal tubercle. In *præsidii* the so called upper margin of the frontal lobe is rather widely separated from the true margin, and might be described as a transverse frontal carina which is elevated a little at the middle and at each extremity. There is in some specimens a very feeble and obtuse vertical carina which is entirely lacking in others. The mentum is as long as wide, impressed only in front. The hind femora of the male have a strong unciform apical tooth. The females differ according to Schaeffer in having the hind femora and tibiæ less broad, and the femoral apical tooth smaller. Occurs in the Huachuca Mts. of Arizona; I have also a male from New Mexico.

14. *O. repandus*, new species.

Robust, rufo- or fulvotestaceous, clothed as usual with short erect fulvous hairs. Labrum very feebly emarginate. Mandibles feebly sinuate externally. Mentum as long as wide, narrowed in front, impressed only for a short distance at the apical

margin which is but slightly emarginate. Frontal lobe broadly arcuate, a strong tubercle at the middle of the margin, which is not distinctly reflexed. Vertex with short transverse carina. Prothorax three fifths as long as wide, sides strongly rounded, surface moderately densely granulate-punctate, median line rather deeply impressed in basal half. Elytra about twice as long as and not appreciably wider than the prothorax; striæ well impressed, stria punctures moderate; sutural angle not dentiform. Upper tooth of front tibia small and remote from the middle tooth. Hind thighs with an acute unciform apical tooth, and another equally acute at the apical third. Hind tibiæ broadly flattened and compressed, subparallel, nearly one half as wide as long. Basal joint of hind tarsus slender and as long as the three following. Length 7.5 mm.; width 4 mm.

Described from two males taken by Prof. F. H. Snow in Cochise Co., Arizona, one labeled "Douglass," the other "San Bernardino Ranch, 3,750 ft."

This species is allied to *presidii* in the expanded hind tibiæ, and to *frontalis* in the form of the mentum and armature of the posterior femora, from both of which it is easily distinguished by the tabular characters.

15. *O. nimius* Fall., Trans. Am. Ent. Soc., 1907, p. 248.

One of our smaller species, similar in size, form and color to *biarmatus*, though not closely related to that species structurally. In its strictly marginal clypeal tubercle it differs from all our species except *gnatho* and *repandus*, the former differing conspicuously by its remarkable mentum and broad head, the latter by its broad flattened hind tibiæ. By its flat and strongly transverse mentum *nimius* is allied to *striatus* and *sparsus*, and by its rather strongly produced mandibles with distinct external angulation and sinuation it resembles *sparsus* and *mandibularis*. The elytral striæ are coarsely punctate, the intervals rather narrow with no more than two punctures in their width. The unique type was taken at light at Mesilla, New Mexico, by Professor Cockerell.

16. *O. frontalis* Lec., Smith. Miscel. Coll., 1863, p. 76.

Complex Lec., Trans. Am. Ent. Soc., 1868, p. 51.

Species of medium size. Mentum as long as wide, nearly flat, a feeble impression in front only. Frontal lobe only moderately advanced, broadly truncate, the tubercle near the frontal suture; vertex transversely carinate. In the male of this species the femoral armature reaches its maximum development, the front and middle as well as the hind thighs having an unciform tooth at apex, the hind thighs an additional acute tooth at apical third, and the front thighs a small tooth

at middle, these latter lacking in some less developed specimens according to Horn. In the female the femora are unarmed.

The type of *frontalis* is in the Ulke collection; it is from Texas. The type of *complex* — from New Mexico — in the LeConte collection bears the label *frontalis* in Horn's handwriting, and with it are three examples from Columbus, Texas, collected by Hubbard and Schwarz. According to Horn the species occurs also in Florida.

17. **O. mandibularis** Linell, Proc. Nat. Mus., 1895, p. 723.

Length 5.75–7.5 mm. The form of the mentum in front is apparently as described in the table, but is very difficult to see because of the numerous hairs. The tabular characters are sufficient for the recognition of this species, which is not closely related to any other except *sparsus*, from which — if we except the somewhat difficult mental character — there is little to depend upon. The size averages greater in *mandibularis* and the prothorax is a little less transverse. The type was described from Winslow, Arizona; it is also known from Las Cruces, Deming and Albuquerque, New Mexico.

18. **O. sparsus** Lec., Trans. Am. Ent. Soc., 1868, p. 51.

The prothorax is shorter in this species than in any other of our forms, being distinctly more than twice as wide as long. The cephalic tubercle is even a trifle more posterior in position than in *mandibularis*, being quite as remote from the frontal margin as from the base of the occiput. The elytral striæ are finer and less impressed than in *mandibularis* and the punctures of the intervals are sparse and scarcely at all asperate, not very different however from *mandibularis*, in this latter respect. The type — length 5 mm. — is from Cañon Blanco, New Mexico. I have a single example — length 5.3 mm. — from Thornton, New Mexico, collected by Dr. Fenyes.

19. **O. estriatus** Schaeff., Can. Ent., 1906, p. 271.

This remarkable species is based upon a specimen taken at Millwood, Fresno Co., California. Mr. Schaeffer places it provisionally in *Ochodeus*, stating that a new genus may yet have to be erected for it. Its peculiarities are summed up by its author as follows: "The more elongate form, the short strongly widening middle and hind tibiæ, the spinous hind trochanters, the elytra without striæ, and the strongly reflexed or rather strongly thickened apical margin of the clypeus will readily distinguish this from any of the described species; it is also remarkable by having one spur of both middle and hind tibiæ pectinate."